

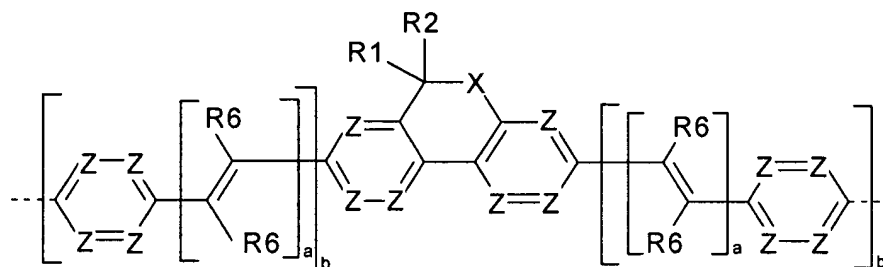
Amendments to the Claims

Please cancel Claim 45. Please amend Claim 56. The Claim Listing below will replace all prior versions of the claims in the application:

Claim Listing

1-36. (Cancelled)

37. (Previously Presented) A polymer, characterized in that it comprises at least 1mol% of units of the formula (I),



FORMULA (I)

where the symbols and indices used have the following meanings:

X is identical or different on each occurrence and is in each case C(R3)(R4) or N(R3);

Z is identical or different on each occurrence and is in each case C(R5) or N;

R1, R2, R3, R4 are identical or different on each occurrence and are in each case H, fluorine, chlorine, bromine, iodine, CN, N(R6)₂, Si(R6)₃ or B(R6)₂, a straight-chain, branched or cyclic alkyl or alkoxy chain having from 1 to 22 carbon atoms in which one or more nonadjacent carbon atoms may also be replaced by NR6, O, S, O-CO-O, CONR6, Si(R6)₂, where one or more H atoms may also be replaced by fluorine, an aryl, heteroaryl or aryloxy group having from 5 to 40 carbon atoms in which one or more carbon atoms may also be replaced by O, S or N and which may also be substituted by one or more nonaromatic radicals R1, with two or more of the radicals R1 to R4 also being able to be joined to form a ring system;

with the proviso that two substituents on one carbon atom are not at the same time an alkoxy or aryloxy side chain and that all substituents R1 to R4 are not at the same time H or not at the same time a methyl group;

R5 is identical or different on each occurrence and is in each case H, F, CN, N(R6)₂ or B(R6)₂, a straight-chain, branched or cyclic alkyl or alkoxy chain having from 1 to 22 carbon atoms in which one or more nonadjacent carbon atoms may also be replaced by O, S, CO-O, O-CO-O, CONR6, Si(R6)₂, where one or more H atoms may also be replaced by fluorine, an aryl, heteroaryl or aryloxy group having from 5 to 40 carbon atoms in which one or more carbon atoms may also be replaced by O, S or N and which may also be substituted by one or more nonaromatic radicals R5; with a plurality of radicals R5 or R5 together with R1 to R4 also being able to form a ring system;

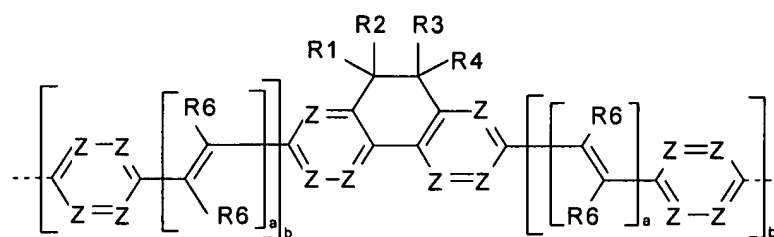
R6 is identical or different on each occurrence and is in each case H, a straight-chain, branched or cyclic alkyl chain having from 1 to 22 carbon atoms in which one or more nonadjacent carbon atoms may also be replaced by O, S, CO-O, O-CO-O, where one or more H atoms may also be replaced by fluorine, an aryl group having from 5 to 40 carbon atoms in which one or more carbon atoms may also be replaced by O, S or N and which may also be substituted by one or more nonaromatic radicals R6;

a is identical or different on each occurrence and is in each case 0 or 1;

b is identical or different on each occurrence and is in each case 0, 1 or 2;

with the proviso that poly(arylene-vinylene) compounds in which one arylene unit is a 9,10-dialkyl-9,10-dihydrophenanthrene are excluded from the invention; and the bond shown as a broken line indicates the linkage in the polymer.

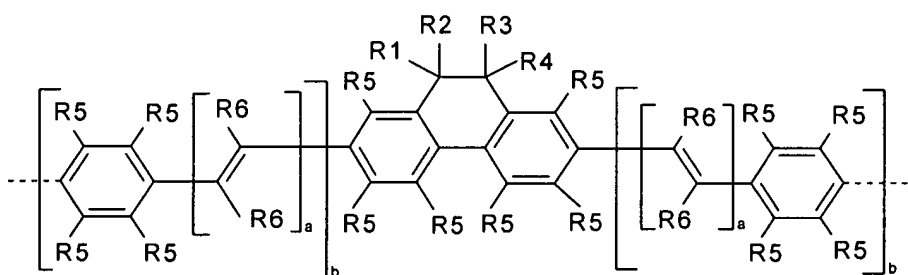
38. (Previously Presented) The polymer as claimed in claim 37, wherein X is C(R3)(R4), as shown in formula (Ia):



FORMULA (Ia)

(Ia).

39. (Previously Presented) The polymer as claimed in claim 38, wherein Z is C(R5), as shown in formula (Ib):



FORMULA (Ib)

(Ib).

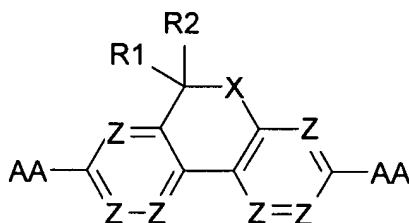
40. (Previously Presented) The polymer as claimed in Claim 37, wherein said polymer is conjugated.
41. (Previously Presented) The polymer as claimed in Claim 37, wherein said polymer further comprises additional units which significantly improve the hole injection and/or transport properties.
42. (Previously Presented) The polymer as claimed in claim 41, wherein the units having hole transport properties are selected from among the structural elements triarylamine derivatives, benzidine derivatives, tetraarylene-para-phenylenediamine derivatives, phenothiazine derivatives, phenoxazine derivatives, dihydrophenazine derivatives, thianthrene derivatives, dibenzo-p-dioxin derivatives, phenoxathiine derivatives, carbazole derivatives, azulene derivatives, thiophene derivatives, pyrrole derivatives, furan derivatives and further O-, S- or N containing heterocycles having a high HOMO.

43. (Previously Presented) The polymer as claimed in Claim 37, wherein said polymer further comprises additional units which significantly improve the electron injection and/or transport properties.
44. (Previously Presented) The polymer as claimed in claim 43, wherein the units having electron transport properties are selected from the structural elements pyridine derivatives, pyrimidine derivatives, pyridazine derivatives, pyrazine derivatives, anthracene derivatives, triarylboranes, oxadiazole derivatives, quinoline derivatives, quinoxaline derivatives, phenazine derivatives, arylboranes and further O-, S- or N containing heterocycles having a low LUMO.
45. (Cancelled).
46. (Previously Presented) The polymer as claimed in Claim 37, wherein said polymer comprises units which alter the emission characteristics so that electrophosphorescence can be obtained instead of electrofluorescence.
47. (Previously Presented) The polymer as claimed in claim 46, wherein the units which make a transfer from singlet excitons to triplet excitons possible and emit light with high efficiency from the triplet state even at room temperature are selected from among compounds which comprise heavy atoms having an atomic number of more than 36.
48. (Previously Presented) The polymer as claimed in claim 47, wherein the heavy atoms are selected from among the elements of groups 8 to 10 (i.e. Ru, Os, Rh, Ir, Pd, Pt).
49. (Previously Presented) The polymer as claimed in Claim 37, wherein said polymer comprises additional units which aid the transition from the singlet state to the triplet state.
50. (Previously Presented) The polymer as claimed in claim 49, wherein the structural units which aid the transition from the singlet state to the triplet state are selected from the group consisting of carbazoles and bridged carbazole dimers.

51. (Previously Presented) The polymer as claimed in Claim 37, wherein further comprising units which influence the morphology or the emission color of the resulting polymer and are selected from among aromatic structures having from 6 to 40 carbon atoms and stilbene, bisstyrylarylene and tolane derivatives, which may each be substituted by one or more nonaromatic radicals R1.
52. (Previously Presented) The polymer as claimed in claim 51, wherein the structural elements described are selected from among 1,4-phenylene, 1,4-naphthylene, 1,4- or 9,10-anthracenylene, 1,6- or 2,7- or 4,9-pyrenylene, 3,9- or 3,10 perylenylene, 2,7- or 3,6-phenanthrenylene, 4,4'-biphenylene, 4,4'' terphenylene, 4,4'-bi-1,1'-naphthylene, 4,5-dihydropyrene, 4,5,9,10 tetrahydropyrene, fluorene, spirobifluorene, 5,7-dihydrodibenzooxepin, cis- or trans-indenofluorene, 4,4'-stilbene, 4,4'' bisstyrylarylene and 4,4'-tolane derivatives.
53. (Previously Presented) The polymer as claimed in Claim 37, wherein an average of at least 2 nonaromatic carbon atoms are present in the substituents per repeating unit.
54. (Previously Presented) The polymer as claimed in Claim 37, wherein substituents of repeating units less than or equal to 12 carbon atoms in a linear chain.
55. (Previously Presented) The polymer as claimed in Claim 37, wherein the following applies to the symbols in the formula (I):
- X is C(R3)(R4) on each occurrence;
 - Z is CH on each occurrence;
 - R1, R3 are identical or different on each occurrence and are each a straight-chain or branched alkyl chain having from 1 to 8 carbon atoms or an aryl group having from 5 to 10 carbon atoms, in which one or more carbon atoms may also be replaced by N, S and/or O and which may also be substituted by one or more nonaromatic radicals R5;
 - R2, R4 are identical or different on each occurrence and are each a straight-chain or branched alkoxy chain having from 1 to 8 carbon atoms;

- a is 1 on each occurrence if the units of the formula (I) are used as emitters;
 b is 1 on each occurrence if the units of the formula (I) are used as emitters
 and is otherwise 0 on each occurrence.

56. (Currently Amended) The polymer as claimed in Claim 37, wherein the structural units of the formula (I) are selected from among units of the formulae (~~LXXIV~~LXXIX) to (CVI).
57. (Previously Presented) The polymer as claimed in Claim 37, wherein that it comprises at least 40 mol% of units of the formula (I).
58. (Previously Presented) A mixture comprising one or more polymers as claimed in Claim 37.
59. (Previously Presented) A solution comprising one or more polymers as claimed in Claim 37 in one or more solvents.
60. (Withdrawn) A monomeric bifunctional compound of the formula (CVII),



FORMULA (CVII) (CVII),

wherein the two functional groups AA, which may be identical or different, copolymerize under conditions of C-C coupling and wherein

- X is identical or different on each occurrence and is in each case C(R3)(R4) or N(R3);
 Z is identical or different on each occurrence and is in each case C(R5) or N;
 R1, R2, R3, R4 are identical or different on each occurrence and are in each case H, fluorine, chlorine, bromine, iodine, CN, N(R6)₂, Si(R6)₃ or B(R6)₂, a straight-

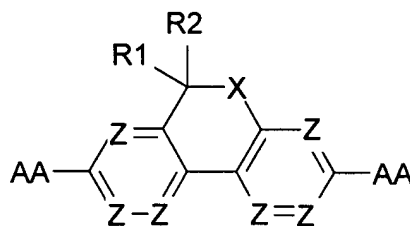
chain, branched or cyclic alkyl or alkoxy chain having from 1 to 22 carbon atoms in which one or more nonadjacent carbon atoms may also be replaced by NR6, O, S, O-CO-O, CONR6, Si(R6)₂, where one or more H atoms may also be replaced by fluorine, an aryl, heteroaryl or aryloxy group having from 5 to 40 carbon atoms in which one or more carbon atoms may also be replaced by O, S or N and which may also be substituted by one or more nonaromatic radicals R1, with two or more of the radicals R1 to R4 also being able to be joined to form a ring system; with the proviso that two substituents on one carbon atom are not at the same time an alkoxy or aryloxy side chain and that all substituents R1 to R4 are not at the same time H or not at the same time a methyl group;

R5 is identical or different on each occurrence and is in each case H, F, CN, N(R6)₂ or B(R6)₂, a straight-chain, branched or cyclic alkyl or alkoxy chain having from 1 to 22 carbon atoms in which one or more nonadjacent carbon atoms may also be replaced by O, S, CO-O, O-CO-O, CONR6, Si(R6)₂, where one or more H atoms may also be replaced by fluorine, an aryl, heteroaryl or aryloxy group having from 5 to 40 carbon atoms in which one or more carbon atoms may also be replaced by O, S or N and which may also be substituted by one or more nonaromatic radicals R5; with a plurality of radicals R5 or R5 together with R1 to R4 also being able to form a ring system;

R6 is identical or different on each occurrence and is in each case H, a straight-chain, branched or cyclic alkyl chain having from 1 to 22 carbon atoms in which one or more nonadjacent carbon atoms may also be replaced by O, S, CO-O, O-CO-O, where one or more H atoms may also be replaced by fluorine, an aryl group having from 5 to 40 carbon atoms in which one or more carbon atoms may also be replaced by O, S or N and which may also be substituted by one or more nonaromatic radicals R6;

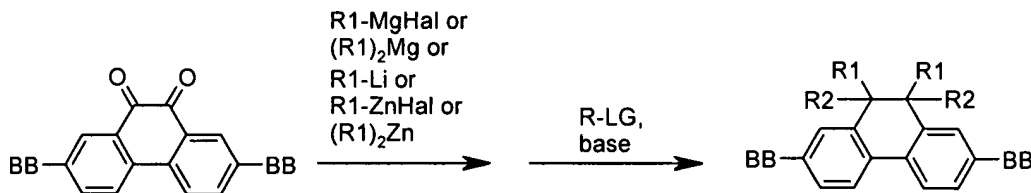
with the proviso that not all radicals R1 to R4 can at the same time be fluorine or chlorine.

61. (Withdrawn) The compound as claimed in claim 60, wherein AA is selected from among the groups Cl, Br, I, O-tosylate, O-triflate, O-SO₂R₅, B(OH)₂, B(OR₅)₂ and Sn(R₅)₃.
62. (Withdrawn) The compound as claimed in claim 61, wherein the C-C coupling reactions are selected from among SUZUKI coupling, YAMAMOTO coupling and STILLE coupling.
63. (Withdrawn) The compound as claimed in claim 60, wherein the monomeric compounds of the formula (CVII) lead to structural units of the formulae (LXXIX) to (CVI) in the polymer.
64. (Withdrawn) A process for preparing symmetrical, monomeric bifunctional compounds of the formula (CVII)



FORMULA (CVII) (CVII),

in which X is C(R₁)(R₂) and Z is C(R₅), wherein a phenanthrenequinone is reacted with an organomagnesium or organolithium or organozinc compound, followed by reaction with an alkylating reagent R-LG under basic conditions, as shown in formula (CVIII):



formula (CVIII)

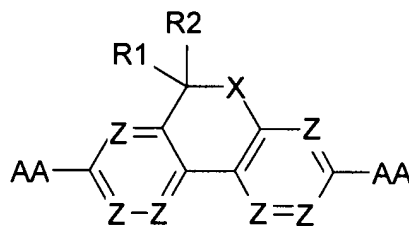
where the symbols used have the following meanings:

BB is identical or different on each occurrence and is in each case H or AA;

AA is a functional group that copolymerizes under conditions of C-C coupling;

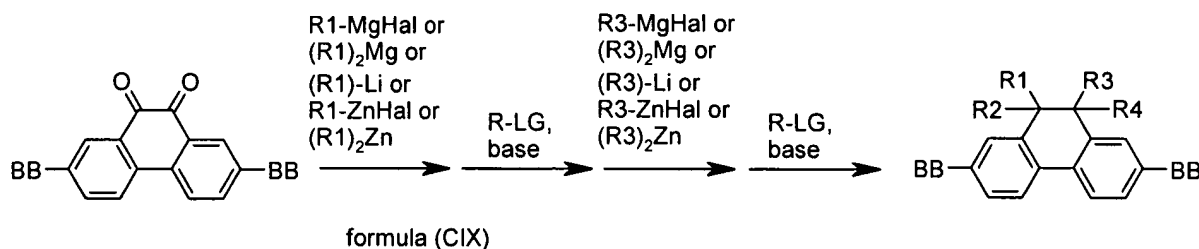
- R-LG is identical or different on each occurrence and is in each case an alkylating reagent, where R is an alkyl group and LG is a group which reacts as a leaving group under the conditions of nucleophilic aliphatic substitution, preferably Cl, Br, I, O-tosylate or O-triflate;
- R1 is an alkyl, aryl or heteroaryl group;
- R2 is an alkoxy group O-R; and
- Hal is F, Cl, Br, I.

65. (Withdrawn) A process for preparing unsymmetrical, monomeric bifunctional compounds of the formula (CVII),



FORMULA (CVII) (CVII),

in which X is C(R3)(R4) and Z is C(R5), wherein a phenanthrenequinone is reacted with an organomagnesium or organolithium or organozinc compound, followed by reaction with an alkylating reagent R-LG as shown in formula (CIX) under basic conditions and repetition of this reaction sequence:



where the symbols used have the following meanings:

- BB is identical or different on each occurrence and is in each case H or has the same meaning as described above for AA;
- R-LG is identical or different on each occurrence and is in each case an alkylating reagent, where R is an alkyl group, preferably a linear or branched

alkyl chain having from 1 to 8 carbon atoms, and LG is a group which reacts as a leaving group under the conditions of nucleophilic aliphatic substitution;

R1, R3 are each an alkyl, aryl or heteroaryl group;

R2, R4 are each an alkoxy group O-R, where R is as defined above; and

Hal is F, Cl, Br, I.

66. (Withdrawn) The process as claimed in claim 64, wherein the leaving group LG is Cl, Br, I, O-tosylate or O-triflate.
67. (Withdrawn) The process as claimed in claim 64, wherein a metal hydride, an alkoxide or a carbonate is used as base.
68. (Withdrawn) The process as claimed in claim 64, wherein a Grignard reagent is used as organometallic compound.
69. (Previously Presented) An organic electronic device, comprising a polymer as claimed in claim 37.
70. (Previously Presented) An electroluminescence material, comprising a polymer as claimed in Claim 37.
71. (Previously Presented) An organic electronic device comprising one or more active layers, wherein at least one of these active layers comprises one or more polymers as claimed in Claim 37.
72. (Previously Presented) The organic electronic device as claimed in claim 71, wherein it is a polymeric light-emitting diode (PLED), an organic integrated circuit (O-IC), an organic field effect transistor (OFET), an organic thin film transistor (OTFT), an organic solar cell (O-SC), an organic photoreceptor or an organic laser diode (O-laser).